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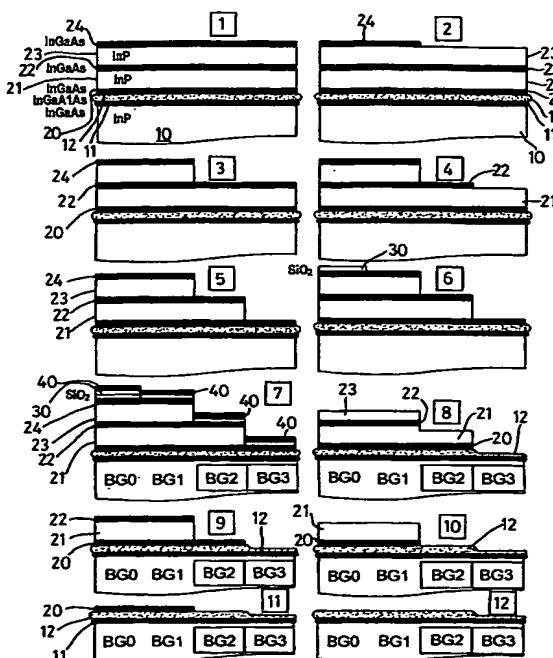
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(54) Title: GENERATING MULTIPLE BANDGAPS USING MULTIPLE EPITAXIAL LAYERS



(57) Abstract: A quantum well intermixing (QWI) technique for modifying an energy bandgap during the formation of optical semiconductor devices enables spatial control of the QWI process so as to achieve differing bandgap shifts across a wafer, device or substrate surface. The method includes: forming a substrate comprising one or more core layers defining at least one quantum well; depositing a succession of intermixing barrier layers over the quantum well, each successive intermixing barrier layer being formed of a semiconductor intermixing barrier layer having a different etch characteristic than an immediately preceding barrier layer; etching away different numbers of the successive barrier layers in different regions of the substrate so as to provide different total thicknesses of barrier layer in different regions of the substrate; and applying an intermixing agent to the surface of the substrate such that the degree of intermixing in the quantum well region varies as a function of the total thickness of barrier layer, thereby forming different bandgaps in the quantum well in each of the respective regions.



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